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EXAMINER	
CHAPEL, DEREK S	

ART UNIT	PAPER NUMBER
2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,850	MAYER ET AL.	
	Examiner	Art Unit	
	DEREK S. CHAPEL	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-11,13-24,26 and 31-35* is/are pending in the application.

4a) Of the above claim(s) *9-11 and 19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-8,13-18,20-24,26 and 31-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *9/29/09 & 7/28/06* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/23/09, 9/28/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status Of Claims

1. This Office Action is in response to an amendment received 4/15/2010 in which Applicant lists claims 9-11 and 19 as being withdrawn, claims 1, 12, 25 and 27-30 as being cancelled, claims 2-8, 13-18, 20-24 and 26 as being currently amended, and claims 31-35 as being new. It is interpreted by the examiner that claims 2-11, 13-24, 26 and 31-35 are pending.

Status Of Case

2. An examination of this application reveals that applicant is unfamiliar with patent prosecution procedure. While an inventor may prosecute the application, lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed. Applicant is advised to secure the services of a registered patent attorney or agent to prosecute the application, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

A listing of registered patent attorneys and agents is available on the USPTO Internet web site http://www.uspto.gov in the Site Index under "Attorney and Agent Roster." Applicants may also obtain a list of registered patent attorneys and agents located in their area by writing to the Mail Stop OED, Director of the U. S. Patent and Trademark Office, PO Box 1450, Alexandria, VA 22313-1450.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

5. The information disclosure statements filed 9/23/2009 and 9/29/2009 (9/29/2009 is a duplicate of 9/23/2009) fails to comply with 37 CFR 1.98(a)(2), **which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed**. Therefore, it has been placed in the application file, but the crossed through information referred to therein has not been considered.

Drawings

6. The amended drawings were received on 9/28/2009 (duplicates of those received on 9/23/2009). These drawings are accepted.

Specification

7. The new abstract of the disclosure is objected to because:

a. On the first line of the abstract, “The invention uncovers a complex polarizer system comprising” should be changed to --A complex polarizer system including--;

b. The abstract is too long;

c. The abstract should only be one paragraph. Correction is required. See MPEP § 608.01(b).

8. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

9. The amendments filed 4/15/2010 and 9/28/2009 (duplicate of the one received 9/23/2009) is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Paragraph [0008] drawn to the Fulkerson et al., U.S. Patent Number 6,490,087, of record (hereafter Fulkerson) was not part of the original disclosure and therefore is considered new matter. This paragraph was not required by the previous office action. Rather, the applicant should have reviewed the Fulkerson reference and may provide comments on how the Fulkerson reference relates to the invention in a “Response” section of the response, not in the specification.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

10. Claims 2-8, 13-18, 20-24, 26 and 31-35 are objected to because of the following informalities:

a. "Pi= P1, P2, P3" should be changed to --Pi, wherein i=1, 2, 3 or 4-- (see at least claim 31);

b. "wherein Vi = V1, V2, V3" should be removed (see at least claim 31);

c. It is interpreted that "each a polarization layer" should be changed to --a polarizing layer-- in the last line of claim 6;

d. It is interpreted that "V2 being perpendicular to V1" was meant to be deleted at the end of claim 21;

e. All instances of "P1", "P2", "P3", "P4", "V1", "V2", "V3", "A1", "A2", "T1", "T2", "T1a", "T1b", etc. because reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

Claims 2-8, 13-18, 20-24, 26 and 32-35 are objected to for inheriting the same informalities through their dependency from claim 31. Appropriate correction is required.

A sample of claim 31 has been provided by the examiner below to show how it should read:

"Complex polarizer system,

comprising an arrangement of at least three polarizing beam splitting layers Pi, wherein i=1, 2, 3 or 4;

each Pi being characterized by its layer vector Vi,

whereas Vi is defined to be coplanar to Pi and is defined such that a linearly polarized light beam propagating towards Pi is reflected at Pi if its plane of polarization is equal to the plane spanned by Vi and the propagation axis of said beam;

a first polarizing beam splitting layer (P1) being configured to split an unpolarized light beam propagating along a first axis (A1) into a transmitted linearly polarized light beam transmitted by first polarizing beam splitting layer (P1), and a reflected linearly polarized light beam reflected by first polarizing beam splitting layer (P1) along a second axis (A2);

a second polarizing beam splitting layer (P2) being arranged along the first axis (A1) such that

the first axis (A1) and a second layer vector (V2) span a plane which is normal to the plane spanned by the first axis (A1) and a first layer vector (V1);

the second polarizing beam splitting layer (P2) and the first polarizing beam splitting layer (P1) therefore being configured as a polarizing beam splitting system

wherein the transmitted linearly polarized light beam which was transmitted by the first polarizing beam splitting layer (P1) along the first axis (A1) is reflected at the second polarizing beam splitting layer (P2);

a third polarizing beam splitting layer (P3) being arranged along the second axis (A2) such that

the second axis (A2) and a third layer vector (V3) span a plane which is normal to the plane spanned by the second axis (A2) and the first layer vector (V1);

the third polarizing beam splitting layer (P3) and the first polarizing beam splitting layer (P1) therefore being configured as a polarizing beam splitting system

wherein the reflected linearly polarized light beam reflected by first polarizing beam splitting layer (P1) into the second axis (A2) is transmitted at the third polarizing beam splitting layer (P3).”

The remainder of the claims should be amended to reflect this format.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 26 provides for the use of a cross-polarizer, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 31, 7, 8, 14, 15, 26, 32 and 33, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Flood, U.S. Patent Number 2,449,287 (hereafter Flood).

15. As to claims 31 and 26, Flood discloses a complex polarizer system (see at least figure 1),

comprising an arrangement of three polarizing beam splitting layers Pi, wherein i=1, 2, 3 or 4 (see at least figure 1, elements 12 separating elements 10; it is noted that the top right element 12 is taken to be P1, the bottom right element 12 is taken to be P2, the top left element 12 (same as P2's element 12) is taken to be P3, and the bottom left element 12 is taken to be P4);

each Pi being characterized by its layer vector Vi (see at least figure 1, elements 12, the plane along 12 into the page),

whereas Vi is defined to be coplanar to Pi and is defined such that a linearly polarized light beam propagating towards Pi is reflected at Pi if its plane of polarization is equal to the plane spanned by Vi and the propagation axis of said beam (see at least figure 1, the beam reflected from P1);

said polarizing beam splitting layer P1 being configured to split an unpolarized light beam propagating along axis A1 (see at least figure 1, the downward direction passing through P1) into a linearly polarized light beam transmitting P1 (see at least figure 1, the beam transmitted through P1 in the downward direction), and a linearly polarized light beam which is reflected by P1 into the axis A2 (see at least figure 1, the beam reflected from P1 toward the left, the left/right direction through element P3 is interpreted to be A2);

said polarizing beam splitting layer P2 being arranged along A1 (see at least figure 1, element P2) such that

A1 and V2 span a plane which is normal to the plane spanned by A1 and V1 (see at least figure 1, elements P1 and P2);

P2 and P1 therefore being configured as a polarizing beam splitting system wherein a linearly polarized beam which transmits P1 along A1 is reflected at P2 (see at least figure 1, the beam passing through P1 and reflecting toward the right off of P2 (14));

said polarizing beam splitting layer P3 being arranged along A2 such that A2 and V3 span a plane which is normal to the plane spanned by A2 and V1 (see at least figure 1, elements P1 and P3);

P3 and P1 therefore being configured as a polarizing beam splitting system wherein a linearly polarized beam which is reflected at P1 into A2 transmits P3 (see at least figure 1, the beam reflected off P1 and passing through P3 (15)).

16. As to claim 7, Flood discloses an additional fourth polarizing beam splitting layer P4 which together with P2 and P3 constitutes an additional complex polarizer system according to claim 31 (see at least figure 1, element P4 as well as figure 7A of the instant application which Applicant points to in the reply received 9/28/2009 as coinciding with claim 7).

17. As to claim 8, Flood discloses P1 and P4 being coplanar and having a common layer vector, and P2 and P3 being coplanar and having a common layer vector (see at least figure 1, elements P1, P2, P3 and P4 as well as figure 7B of the instant application which Applicant points to in the reply received 9/28/2009 as coinciding with claim 8).

18. As to claim 14, Flood discloses all of said Pi being thin-film polarizers of the MacNeille type (see at least column 1 of Flood).

19. As to claim 15, Flood discloses all of said Pi being contained in a body with windows or openings (see at least figure 1, elements 10 which are interpreted to form a "body" containing the polarizing beam splitting layers and the outside faces of elements 10 are considered to be the "windows or openings" since that is where the light enters and exits the system).

20. As to claim 32, Flood discloses at least one right triangular prism (see at least figure 1, elements 10); at least one lateral surface of said prism carrying a polarizing beam splitting layer Pi (see at least figure 1, elements 12).

21. As to claim 33, Flood discloses two lateral surfaces of said prism carrying polarizing beam splitting layers (see at least figure 1, elements P1 and P3, P1 and P2, P2 and P4, or P4 and P3).

22. Claims 31, 7, 8, 15, 16, 17, 20, 26, 32 and 33, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Fulkerson et al., U.S. Patent Number 6,490,087 B1, of record (hereafter Fulkerson).

23. As to claims 31 and 26, Fulkerson discloses a complex polarizer system (see at least figure 6),

comprising an arrangement of three polarizing beam splitting layers Pi, wherein i=1, 2, 3 or 4 (see at least figure 6, elements 6 and 7 separating the triangular prism elements; it is noted that the two bottom triangular prism elements (element 1 and the prism to the immediate right of element 1) are taken to be bounded by P1 on the left (lower left element 6) and P3 on the right (lower right element 7), the two left-most triangular prism elements (element 3 and the prism to immediate above element 3) are taken to be bounded by P1 on the bottom (lower left element 6) and P2 on the top (upper left element 7), the two top triangular prism elements (element 2 and the prism to the immediate left of element 2) are taken to be bounded by P2 on the left (upper left element 7) and P4 on the right (upper right element 6), and the two right triangular prism elements (element 4 and the prism immediately below element 4) are taken to be bounded by P4 on the top (upper right element 6) and P3 on the bottom (lower right element 7);

each Pi being characterized by its layer vector Vi (see at least figure 6, elements P1, P2, P3, and P4, the plane along elements 6 and 7 into the page),

whereas Vi is defined to be coplanar to Pi and is defined such that a linearly polarized light beam propagating towards Pi is reflected at Pi if its plane of polarization

is equal to the plane spanned by Vi and the propagation axis of said beam (see at least figure 6, element P1 as well as paragraph [0008] of the instant specification which describes the s-polarization being reflected);

said polarizing beam splitting layer P1 being configured to split an unpolarized light beam propagating along axis A1 (see at least figure 6, the light entering the system along A1) into a linearly polarized light beam transmitting P1 (see at least figure 6, the beam transmitted through P1 in the upward direction), and a linearly polarized light beam which is reflected by P1 into the axis A2 (see at least figure 6, the beam reflected from P1 toward the right, the left/right direction through element P3 is interpreted to be A2);

said polarizing beam splitting layer P2 being arranged along A1 (see at least figure 6, element P2) such that

A1 and V2 span a plane which is normal to the plane spanned by A1 and V1 (see at least figure 6, elements P1 and P2);

P2 and P1 therefore being configured as a polarizing beam splitting system wherein a linearly polarized beam which transmits P1 along A1 is reflected at P2 (see at least figure 6, the beam passing through P1 and reflecting toward the left off of P2);

said polarizing beam splitting layer P3 being arranged along A2 such that A2 and V3 span a plane which is normal to the plane spanned by A2 and V1 (see at least figure 6, elements P1 and P3);

P3 and P1 therefore being configured as a polarizing beam splitting system wherein a linearly polarized beam which is reflected at P1 into A2 transmits P3 (see at least figure 6, the beam reflected off P1 and passing through P3).

24. As to claim 7, Fulkerson discloses an additional fourth polarizing beam splitting layer P4 which together with P2 and P3 constitutes an additional complex polarizer system according to claim 31 (see at least figure 6, element P4 as well as figure 7A of the instant application which Applicant points to in the reply received 9/28/2009 as coinciding with claim 7).

25. As to claim 8, Fulkerson discloses P1 and P4 being coplanar and having a common layer vector, and P2 and P3 being coplanar and having a common layer vector (see at least figure 6, elements P1, P2, P3 and P4 as well as figure 7B of the instant application which Applicant points to in the reply received 9/28/2009 as coinciding with claim 8).

26. As to claim 15, Fulkerson discloses all of said Pi being contained in a body with windows or openings (see at least figure 6, the prism elements which are interpreted to form a “body” containing the polarizing beam splitting layers and the outside faces of the prism elements are considered to be the “windows or openings” since that is where the light enters and exits the system).

27. As to claim 16, Fulkerson discloses at least two spatial light modulators (see at least figure 6, elements 8 and 9); said complex polarizer system being used to feed the spatial light modulators with polarized light (see at least figure 6).

28. As to claim 17, Fulkerson discloses at least two spatial light modulators (see at least figure 6, elements 8 and 9); said complex polarizer system being used to superpose the modulated light from the spatial light modulators (see at least figure 6).

29. As to claim 20, Fulkerson discloses at least one spatial light modulator which is mounted to the body (see at least figure 6, elements 8 and 9).

30. As to claim 32, Fulkerson discloses at least one right triangular prism (see at least figure 6, the two bottom triangular prism elements (element 1 and the prism to the immediate right of element 1) P1 and P3 are taken to be this "one right triangular prism"); at least one lateral surface of said prism carrying a polarizing beam splitting layer Pi (see at least figure 6, P1 or P3).

31. As to claim 33, Fulkerson discloses two lateral surfaces of said prism carrying polarizing beam splitting layers (see at least figure 6, P1 and P3).

Claim Rejections - 35 USC § 103

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

33. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

34. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

35. Claims 2, 3, 4, 5, 6, 13, 21, 22, 24, 34 and 35, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Flood, U.S. Patent Number 2,449,287 (hereafter Flood) in view of Mi et al., U.S. Patent Application Publication Number 2003/0128320 A1 (hereafter Mi) and Edlinger et al., U.S. Patent Number 6,476,972 B2 (hereafter Edlinger).

36. As to claims 2, 3, 4, 5, 6, 13, 21, 22, 24, 34 and 35 Flood discloses that V1 is perpendicular to V2 (see at least figure 1, elements P1 and P2 of Flood), said polarizing layers P2 and P3 being part of a common polarizing beam splitting layer with a common layer vector (see at least figure 1, elements P2 and P3 of Flood).

Flood further discloses at least one composed prism (see at least figure 1, the prisms 10 that surround P1 of Flood) with a triangular base (see at least figure 1, the prisms 10 that surround P1 of Flood) comprising two right sub-prisms with a triangular base (see at least figure 1, element 10 bordered by P1 and P3 and element 10

bordered by P1 and P2 of Flood); the lateral surface of the second sub-prism, facing the first sub-prism, carrying a polarization layer P1 (see at least figure 1, the prisms 10 that surround P1 of Flood); the lateral surface of the first sub-prism, which together with a lateral surface of the second sub-prism, forms a common lateral surface of said composed prism carrying a polarization layer P2 (see at least figure 1, element 12 that forms P2 and P3 of Flood).

Flood does not specifically disclose that Cartesian polarizers (e.g. wire-grid polarizers) may be used as the polarizing beam splitting layers, or that the triangular prisms of the optical system are isosceles triangles.

However, Mi teaches that it is well known to use wire-grid polarizers in projection systems where MacNeille polarizers have traditionally been used in the past (see at least paragraphs [0008]-[0010], [0013], [0023], and [0039]-[0041] of Mi).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the complex polarizer system of Flood to include the teachings of Mi so that one, some, or all of the polarizing beam splitting layers of Flood are wire-grid polarizers, for the purpose of taking advantage of the high reflectivity and wide angular range of wire-grid polarizers.

Further, Edlinger teaches using isosceles triangular prisms in an X-cube configuration (see at least figure 1 and column 1, lines 50-67 of Edlinger).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the complex polarizer system of Flood in view of Mi to include the teachings of Edlinger so that the triangular prisms are isosceles

triangular prisms, for the purpose of using well known and readily available prisms, and so that the light is incident on the polarizing beam splitting layers at approximately 45 degrees to maximize the effectiveness of the MacNeille polarizing layers.

37. Claims 2, 3, 5, 6, 13, 14, 21, 22, 23, 24, 34 and 35, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulkerson et al., U.S. Patent Number 6,490,087 B1, of record (hereafter Fulkerson) in view of Mi et al., U.S. Patent Application Publication Number 2003/0128320 A1 (hereafter Mi) and Edlinger et al., U.S. Patent Number 6,476,972 B2 (hereafter Edlinger).

38. As to claims 2, 3, 5, 6, 13, 14, 21, 22, 23, 24, 34 and 35 Fulkerson discloses that V1 is perpendicular to V2 (see at least figure 6, elements P1 and P2 of Fulkerson).

Fulkerson further discloses at least one composed prism (see at least figure 6, the two bottom triangular prism elements (element 1 and the prism to the immediate right of element 1) as well as the two left triangular prism elements (element 3 and the prism immediately above element 3)) with a triangular base (see at least figure 6, the two bottom triangular prism elements (element 1 and the prism to the immediate right of element 1) as well as the two left triangular prism elements (element 3 and the prism immediately above element 3)) comprising two right sub-prisms with a triangular base (see at least figure 6, the two bottom triangular prism elements (element 1 and the prism to the immediate right of element 1) as well as the two left triangular prism elements (element 3 and the prism immediately above element 3)); the lateral surface of the second sub-prism, facing the first sub-prism, carrying a polarization layer P1 (see at

least figure 6, P1 of Fulkerson); the lateral surface of the first sub-prism, which together with a lateral surface of the second sub-prism, forms a common lateral surface of said composed prism carrying a polarization layer P2 (see at least figure 6, P1 of Fulkerson).

Finally, Fulkerson discloses at least one right triangular prism (see at least figure 6, the two left triangular prism elements (element 3 and the prism immediately above element 3)); said prism being a compound prism composed of two right triangular sub-prisms with the base of a triangle each (see at least figure 6, the two left triangular prism elements (element 3 and the prism immediately above element 3)); those lateral surfaces of the compound prism which consist of only one lateral surface of the sub-prisms carrying P1 and P2 (see at least figure 6, the two left triangular prism elements (element 3 and the prism immediately above element 3)).

Fulkerson does not specifically disclose that the polarizers used may be Cartesian (e.g. wire-grid polarizers) or thin-film type (e.g. MacNeille polarizers) polarizers, or that the triangular prisms of the optical system are isosceles triangles.

However, Mi teaches that it is well known to use MacNeille or wire-grid polarizers in past and present projection systems (see at least paragraphs [0008]-[0010], [0013], [0023], and [0039]-[0041] of Mi).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the complex polarizer system of Fulkerson to include the teachings of Mi so that one, some, or all of the polarizing beam splitting layers of Fulkerson are wire-grid polarizers, MacNeille polarizers, or a combination of both, for the purpose of taking advantage of the high reflectivity and wide angular range

of wire-grid polarizers and the ready availability and high extinction ratio of MacNeille polarizers.

Further, Edlinger teaches using isosceles triangular prisms in an X-cube configuration (see at least figure 1 and column 1, lines 50-67 of Edlinger).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the complex polarizer system of Fulkerson in view of Mi to include the teachings of Edlinger so that the triangular prisms are isosceles triangular prisms, for the purpose of using well known and readily available prisms, and so that the light is incident on the polarizing beam splitting layers at approximately 45 degrees to maximize the effectiveness of the MacNeille polarizing layers.

39. Claim 18, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulkerson et al., U.S. Patent Number 6,490,087 B1, of record (hereafter Fulkerson) in view of Mi et al., U.S. Patent Application Publication Number 2003/0128320 A1 (hereafter Mi).

40. As to claim 18, Fulkerson discloses at least two spatial light modulators (see at least figure 6, elements 8 and 9) wherein said complex polarizer system is used to feed the spatial light modulators with polarized light and to superpose the modulated light from the spatial light modulators (see at least figure 6).

Fulkerson does not specifically disclose that the at least two spatial light modulators are micro-electro-mechanical-systems.

However, Mi teaches that micro-electro-mechanical-systems (Digital Micromirror Devices (DMDs)) can be employed as spatial light modulators (see at least paragraph [0004] of Mi).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the complex polarizer system of Fulkerson to include the teachings of Mi so that the spatial light modulators are micro-electro-mechanical-systems, for the purpose of providing high light throughput, contrast ratios and color gamuts.

Other Related Art

41. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

42. Applicant is directed to Menard, U.S. Patent Number 6,377,318 B1 as disclosing housings for x-cubes; Huang et al., U.S. Patent Number 6,309,071 B1 as disclosing a similar complex polarizer system; and Lin, U.S. Patent Number 6,530,663 B2 as disclosing a similar complex polarizer system.

Response to Arguments

43. Applicant's arguments filed 4/15/2010 have been fully considered but they are not persuasive. The remarks drawn to Fulkerson having additional half-wave plates are not persuasive. The claims use “comprising” language and do not exclude the use of additional half-wave plates. Therefore, the claims stand rejected as set forth above.

Amendment Guidelines

44. For the applicant's convenience and to assist you in providing future amendments that are in compliance with the M.P.E.P, section C of section 714 of the M.P.E.P. regarding amendments to the claims has been copied below:

> **C. Amendments to the Claims**
>
> Each amendment document that includes a change to an existing claim, including the deletion of an existing claim, or submission of a new claim, must include a complete listing of all claims ever presented (including previously canceled and non-entered claims) in the application. After each claim number, the status identifier of the claim must be presented in a parenthetical expression, and the text of each claim under examination as well as all withdrawn claims (each with markings if any, to show current changes) must be presented.
>
> The listing will serve to replace all prior versions of the claims in the application.
>
> (A) Status Identifiers: The current status of all of the claims in the application, including any previously canceled or withdrawn claims, must be given. Status is indicated in a parenthetical expression following the claim number by one of the following status identifiers:
>
> (original),
> (currently amended),
> (previously presented),
> (canceled),
> (withdrawn),
> (new),
> or (not entered).
>
> The status identifier (withdrawn – currently amended) is also acceptable for a withdrawn claim that is being currently amended. See paragraph (E) below for acceptable alternative status identifiers.
>
> Claims added by a preliminary amendment must have the status identifier (new) instead of (original), even when the preliminary amendment is present on the filing date of the application and such claim is treated as part of the original disclosure. If applicant files a subsequent amendment, applicant must use the status identifier (previously presented) if the claims are not being amended, or (currently amended) if the claims are being amended, in the subsequent amendment. Claims that are canceled by a preliminary amendment that is present
> on the filing date of the application are required to be listed and must have the status identifier (canceled) in the preliminary amendment and in any subsequent amendment.
>
> The status identifier (not entered) is used for claims that were previously proposed in an amendment (e.g., after-final) that was denied entry.

> In an amendment submitted in a U.S. national stage application, claims that were present on the international filing date or rectified pursuant to PCT Rule 91 must have the status identifier (original); claims that were amended or added under PCT Article 19 or 34 with effect in the U.S. national stage application must have the status identifier (previously presented); and claims that were canceled pursuant to PCT Article 19 or 34 with effect in the U.S. national stage application must have the status identifier (canceled). If the amendment submitted in the U.S. national stage application is making a change in a claim, the status identifier (currently amended) must be used for that claim.<

For any amendment being filed in response to a restriction or election of species requirement and any subsequent amendment, any claims which are non-elected must have the status identifier (withdrawn). Any non-elected claims which are being amended must have either the status identifier (withdrawn) or (withdrawn – currently amended) and the text of the non-elected claims must be presented with markings to indicate the changes. Any non-elected claims that are being canceled must have the status identifier (canceled).

(B) Markings to Show the Changes: All claims being currently amended must be presented with markings to indicate the changes that have been made relative to the immediate prior version. The changes in any amended claim must be shown by strike-through (for deleted matter) or underlining (for added matter) with 2 exceptions: (1) for deletion of five or fewer consecutive characters, double brackets may be used (e.g., [[eroor]]); (2) if strike-through cannot be easily perceived (e.g., deletion of number “4” or certain punctuation marks), double brackets must be used (e.g., [[4]]). As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strike-through, followed by including and underlining the extra text with the desired change (e.g., _____ number 4 as number 14 as). An accompanying clean version is not required and should not be presented. Only claims of the status “currently amended” or “withdrawn” will include markings.
Any claims added by amendment must be indicated as “new” and the text of the claim must not be underlined.

(C) Claim Text: The text of all pending claims under examination and withdrawn claims must be submitted each time any claim is amended. The text of

pending claims not being currently amended, including withdrawn claims, must be presented in clean version, i.e., without any markings. Any claim presented in clean version will constitute an assertion that it has not been changed relative to the immediate prior version except to omit markings that may have been present in the immediate prior version of the claims. A claim being canceled must be indicated as "canceled;" the text of the claim must not be presented. Providing an instruction to cancel is optional. Canceled and not entered claims must be listed by only the claim number and status identifier, without presenting the text of the claims. When applicant submits the text of canceled or not-entered claims in the amendment, the Office may accept such an amendment, if the amendment otherwise complies with 37 CFR 1.121, instead of sending out a notice of non-compliant amendment to reduce the processing time.

(D) Claim Numbering: All of the claims in each amendment paper must be presented in ascending numerical order. Consecutive canceled or not entered claims may be aggregated into one statement (e.g., Claims 1 – 5 (canceled)).

A canceled claim can be reinstated only by a subsequent amendment presenting the claim as a new claim with a new claim number. The original numbering of the claims must be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. For example, when applicant cancels all of the claims in the original specification and adds a new set of claims, the claim listing must include all of the canceled claims with the status identifier (canceled) (the canceled claims may be aggregated into one statement). The new claims must be numbered consecutively beginning with the number next following the highest numbered claim previously presented (whether entered or not) in compliance with 37 CFR 1.126.
Example of listing of claims:

Claims 1-5 (canceled)

Claim 6 (withdrawn): A process for molding a bucket.

Claim 7 (previously presented): A bucket with a handle.

Claim 8 (currently amended): A bucket with a ____ green blue handle.

Claim 9 (withdrawn): The process for molding a bucket of claim 6 using molten plastic material.

Claim 10 (original): The bucket of claim 8 with a wooden handle.

Claim 11 (canceled)

Claim 12 (previously presented): A bucket having a circumferential upper lip.

Claim 13 (not entered)

Claim 14 (new): A bucket with plastic sides and bottom.

Conclusion

45. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

46. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEREK S. CHAPEL whose telephone number is (571)272-8042. The examiner can normally be reached on M-F 10:30am-7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. S. C./
Examiner, Art Unit 2872
7/1/2010

/Stephone B. Allen/
Supervisory Patent Examiner
Art Unit 2872